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Lembosia bezerrae, a new asterinaceous fungus associated with a terrestrial orchid from Bahia, Brazil

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Abstract — A new species of *Lembosia* was found associated with living leaves of *Sobralia liliastrum* (*Orchidaceae*) in a stretch of Atlantic Forest in Serra da Jibóia, Bahia, Brazil. This species is fully described, illustrated, discussed, and compared with allied species on *Orchidaceae*.

Key words — *Dothideomycetes*, *Asterinales*, foliicolous fungi, taxonomy, tropical fungi

Introduction

Sobralia Ruiz & Pav. is a large genus in the *Orchidaceae* with about 150 species distributed throughout Mexico, Peru, Bolivia, and Brazil. *Sobralia* species are usually terrestrial and herbaceous (Szlachetko et al. 2009). Plants of *S. liliastrum* with a black fungus covering portions of their living leaves were observed in a stretch of Atlantic Forest in Serra da Jibóia, Bahia, Brazil. This orchid species has potential for cultivation and marketing due its beautiful white flowers with yellow lobes (Plate 1). Although observed only on plants in nature, the black fungus could become a potentially serious problem for orchid growers, because superficial black fungal colonies covering portions of the foliage decrease the aesthetic value of ornamental plants (Pereira et al. 2006) and there are no registered chemical products to control fungi on orchids (Silva et al. 2008; Silva & Pereira 2008; Lopes et al. 2009). Examination of the collected samples indicated that the black colonies belonged to *Lembosia*, a genus proposed by Léveillé in 1845 with *L. tenella* Lév. as its type. This genus is characterized by a linear or Y-shaped hysterothecium opening with a longitudinal slit and adherence to its host using superficial hyphae with lateral hyphopodia (Song & Hosagoudar 2003, Bezerra 2004). In this paper, we describe our collections as a new *Lembosia* species on *Orchidaceae*.

Material & methods

Leaves covered with black colonies were collected, photographed, and dried in a plant press. Small samples were examined under an Olympus SZ40 stereomicroscope; the fungus was removed from dried leaf colonies and mounted in lactophenol and Melzer's reagent. Observations, measurements, and drawings were made with a Carl Zeiss Standard W light microscope (Göttingen, Germany). The nail polish technique was used to study colony morphology (Hosagoudar & Kapoor 1984). Photographs were obtained on an Olympus BX51 microscope equipped with a digital camera (E–volt 330). For scanning electron microscopy (SEM), air-dried material was directly mounted and coated with a thin layer of gold using a sputter coater (Balzers® model FDU 010) for 2 min. Photographs were obtained using a Carl-Zeiss Model LEO VP 1430 scanning electron microscope. Representative specimens of the fungi were deposited in the herbarium of the Universidade Federal de Viçosa (Herbarium VIC).

Taxonomy

Lembosia bezerrae Firmino & O.L. Pereira, **sp. nov.** Plates 1c,2,3

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Differs from *Lembosia sertiferae* by its straight hyphae, smaller and rounded hyphopodia, larger hysterothecia, and smaller ascospores.

Type: Brazil, Bahia, Santa Terezinha, Serra da Jibóia, on living leaves of *Sobralia liliastrum* Lindl. (*Orchidaceae*), 25 September. 2010, O. L. Pereira (VIC 31942, **holotype**).

Etymology: referring to the great Brazilian mycologist, Dr. José Luiz Bezerra.

Colonies epiphyllous, irregular to circular, single to confluent, black. Hyphae straight to flexuous, branching, irregular, brown, septate, hyphal cells cylindrical, 4–5 µm, smooth. Hyphopodia few, entire, sessile, globose to pyriform, straight to angular, unicellular, 4.5–5 × 4.5–5 µm, brown, penetration peg in middle part of hyphopodia cell. Hysterothecia superficial, developed below mycelium surface, mostly linear, rarely Y-shaped, single, fringed at margins, 521.5–1853 × 85–109 µm diam., dark brown to blackish, open by longitudinal fissures. Scutellum radiate, composed of isodiametric to cylindrical cells, straight. Asci saccate to ovoid, bitunicate, 8-spored, 27.5–34 × 12–17.5 µm, hyaline. Paraphyses hyaline, filiform and unbranched. Ascospores fusiform, 2-celled, constricted at the septum, hyaline when immature, becoming brown at maturity, smooth, 14–16 × 4–5 µm. Anamorph absent.

Comments — Four species of *Lembosia* (Table 1) have been reported previously in association with orchidaceous hosts (Song & Hosagoudar 2003; Silva & Pereira 2008). Of these, only *Lembosia epidendri* Meir. Silva & O.L. Pereira is known from Brazil (Silva & Pereira 2008).

Lembosia bezerrae is similar to *L. sertiferae* Syd., *L. dendrochili* Lév., and *L. epidendri*. However, *L. sertiferae* differs by its reticulately branched hyphae, larger and lobately incised hyphopodia, smaller hysterothecia, and larger

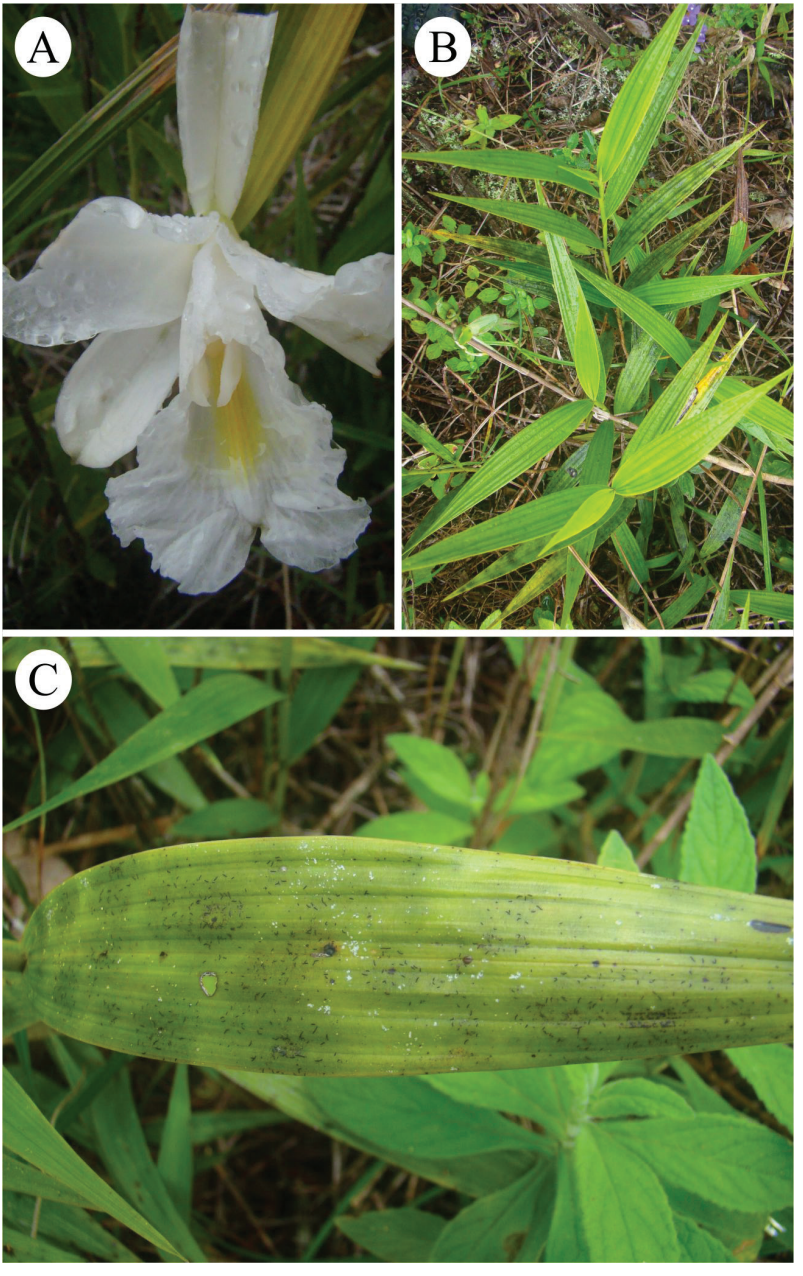

Plate 1. *Sobralia liliastrum*. A: White flowers with yellow lobe. B: Infected plant in the field. C: Symptoms on naturally infected plant.

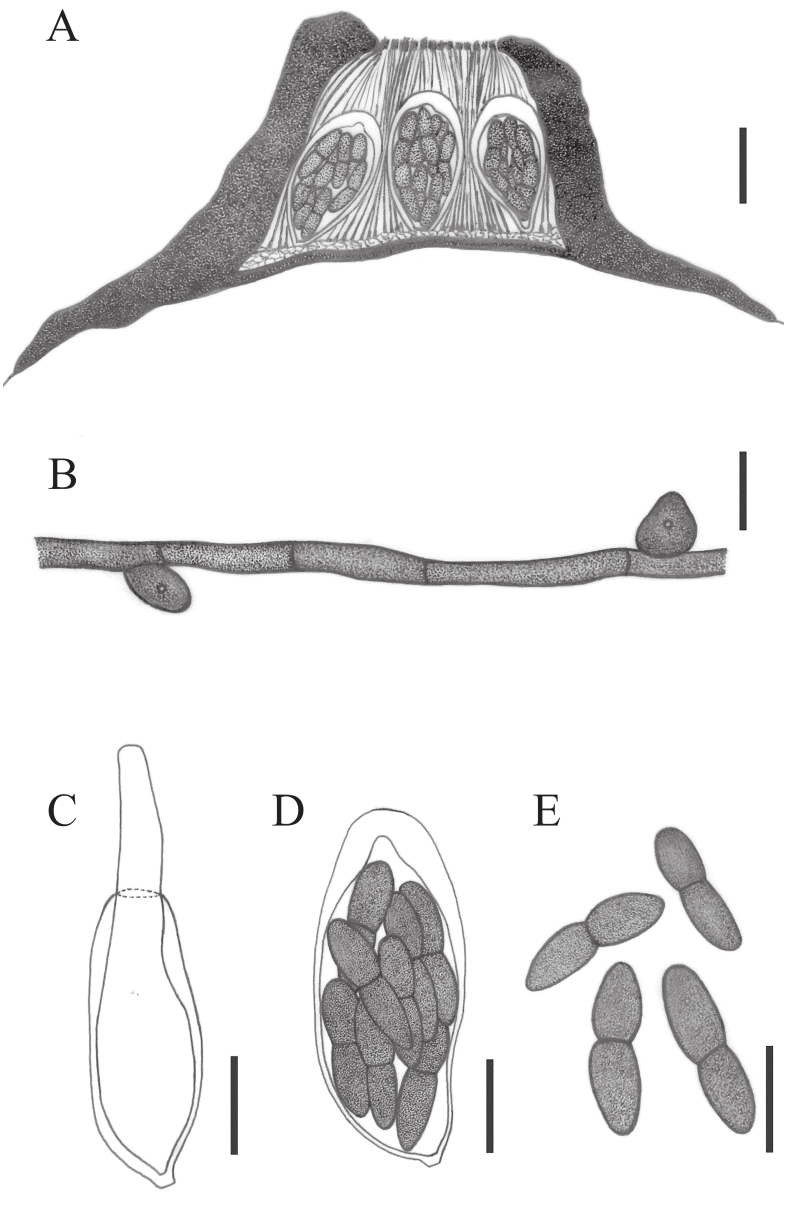

Plate 2. *Lembosia bezerrae* (holotype, VIC 31942).
A: Cross section of a hysterothecium. B: Surface mycelium with hyphopodia.
C: Fissitunicate ascus. D: Bitunicate ascus with mature ascospores.
E: Brown, smooth, fusiform ascospores. Scale bars: A = 20 µm; B,C,D,E = 10 µm.

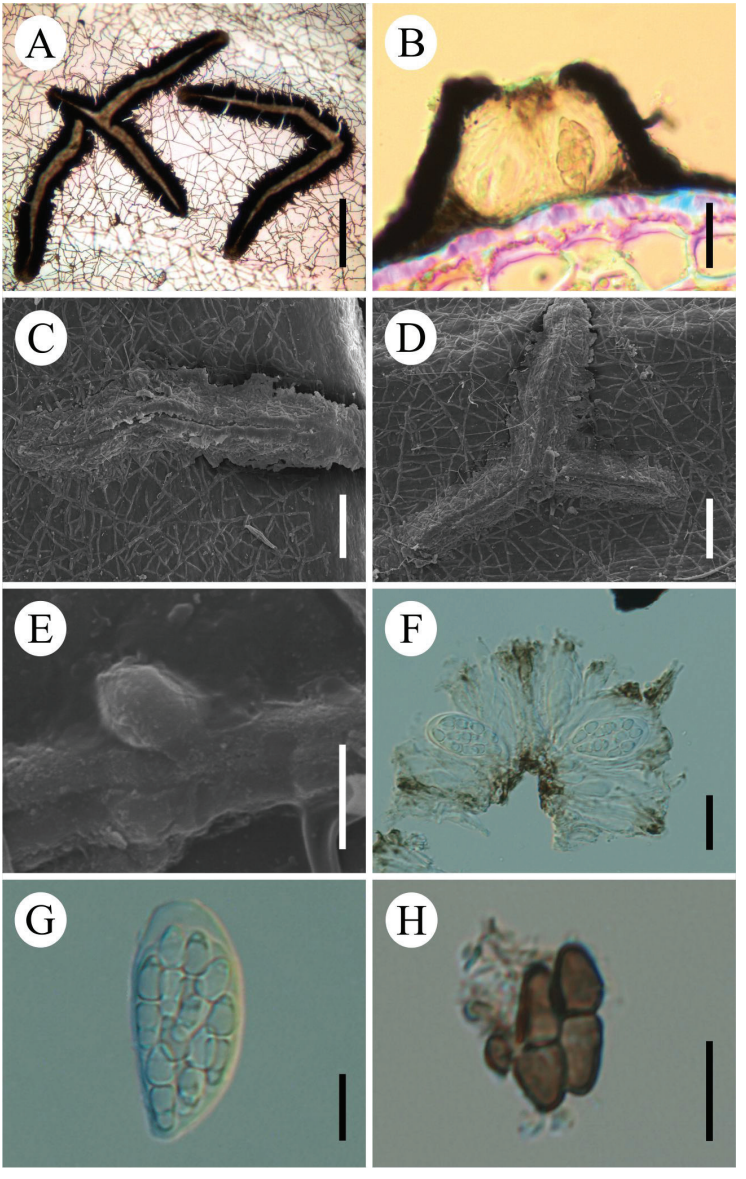

Plate 3. *Lembosia bezerrae* (holotype, VIC 31942). A: Part of a colony with open hysterothecia and surface mycelium. B: Cross section of a hysterothecium. C: Linear hysterothecium. D: Y-shaped hysterothecium. E: Sessile, globose, straight to angular, unicellular hyphopodium. F: Agglomerate and parallel asci. G: Bitunicate ascus with hyaline ascospores. H: Brown, smooth, fusiform ascospores. Scale bars: A = 200 µm; B,F = 20 µm; C,D = 100 µm; E = 5 µm; G,H = 10 µm.

Table 1. Biometric data (µm) of *Lembosia* species on *Orchidaceae*.

Species	Hyphae	Hyphopodia	Hysterothecia	Asci	Ascospores
L. bezerrae	4–5	4.5–5	520–1850 × 85–110	27.5–34 × 12–17.5	14–16 × 4–5
L. rolfsii	—	—	360–1000 × 160	20–40 × 8–15	10–16 × 4–5
L. sertiferae	3–4	6–8	300–800 × 160–220	35–42 × 20–24	16–18 × 6–7
L.dendrochili	3–4	6–7	400–650 × 120–160	45 × 28	16–19 × 7–8
L. epidendri	< 3	6–9.5	320–580 × 135–250	28–63 × 16–25	16–22 × 6–9.5

ascospores (Sydow 1939); *L. dendrochili* differs by its smaller hysterothecia and hyphae, and larger hyphopodia and ascospores (Léveillé 1845); and *L. epidendri* differs by its smaller hysterothecia, asci, and hyphae and larger hyphopodia and ascospores (Silva & Pereira 2008).

Although *Lembosia rolfsii* W.T. Horne is morphologically close to *L. bezerrae*, it probably is better placed in *Maheshwaramyces* Hosag. due to the presence of subcuticular mycelium and conidia on superficial mycelium (Hosagoudar et al. 2009, Horne 1905). *Lembosia bezerrae* is the first member of the *Asterinales* reported on the orchid genus *Sobralia*.

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